The Tailwind

AMA Charter No. 704

JULY | DON LEWIS, EDITOR | 2017

Next Meeting on Thursday, July 20 – At the Field!

Be sure to check out the website at www.fly-hrcc.org

Meeting Minutes

The meeting was called to order at 7:00 PM by L. Perkes.

Attendees: L. Perkes, B. Pruner, D. Lewis, C. Tackett

The meeting minutes from the last meeting (March) were published in the May Tailwind. D. Lewis moved to accept as published; C. Tackett seconded, passed unanimously.

L. Perkes presented the Treasurer's Report (below). D. Lewis moved to accept; C. Tackett seconded; passed unanimously.

Old Business

- Discussed large plane starting area post location. Agreed to locate adjacent to starting area for pilot station 3.
- Discussed field mods (fencing) – tabled until we find time to implement.
- Don to publish mowing schedule.
- MTRCCA spring meet went well and was profitable. Fall Air Show is September 9-10 at the Dixon airport.

New Business

There was no new business.

There being no further business, the meeting was adjourned at 7:06.

Treasurer's Report

Opening balance	$ 1,670.22
Income	-.-
Expenses	(17.88)
Closing balance	$ 1,652.34

Mechanics – Control Linkage and Hinges

From Buzzard Droppings, Barnyard Buzzards RC Club, Duball, Washington

The purpose of control linkage is to take the motion generated by the radio control servos and transfer it to the airplane's control surfaces and other control devices. Since this motion is mechanical, there are considerations for choosing one technique over another.

In its simplest terms, a control linkage will include a servo control arm, push rod, control horn, and a way to attach the push rod to the servo control arm and control horn, some way to adjust the position, distance of movement, and the controlled device itself. This is obvious to those of us who have been around the RC circuit for a while, but for the newcomer, this is a challenging topic.

Always plan ahead and avoid mechanical interferences between the moving parts. Engine vibration, inertia, and G-forces will cause our control linkages to behave erratically. These forces introduce stress and must be considered, even in a docile trainer.

Cost
The real cost of the control linkage is the price of the entire model if it were to fail doing its job! If we take into consideration the initial cost of the hardware, the time it takes to install, adjust, and lock, special tools, as well as any maintenance during the life of a model, we might want to consider using the higher initial price of carbon fiber push rods (titanium ends give you special bragging rights!), nylon brushed control horns, ball/stud clevises, etc.

The old adage, "you get what you pay for," comes into play here, especially for the Giant Scale and Speed models. Often, we use parts because they are part of a kit. We forget that the kit manufacturer makes choices based on cost—many times providing parts that "will do" as opposed to those best for the application. Some don't even provide these parts, leaving the choice to the preference of the model builder.

Precision and Strength
The important measurement for the control surface is whether it will provide the proper movement, with no slop, exact mechanical repeatability, no wear, and no maintenance. It must tolerate the stress placed on it during normal, reasonable flight. It should tolerate changes in temperature, and wear slowly. Parts that have been problematic over time are:

• Threaded metal clevises that can split apart and/or become stripped by vibration (Sullivan provides an interlocking design that is good).
• Nylon parts that are too soft or too brittle.
• Wooden dowels that twist and warp from moisture.
• Incorrect application or numbers of supports.
• Incorrect application (i.e. braided wire for elevators … yikes)!

Size and Space
These seem obvious until you consider that each model has many moving parts that may interfere with each other as they move. Some planning for the elevator and rudder push rods is required, even on ARF aircraft, or problems will occur.

Some problems occur with the aileron movement, noticed only when the wing is mounted to the fuselage (parts hit items mounted in the fuselage). Sometimes the needed supports cannot be installed because the construction has already progressed past the point of making this easy (think of an ARF fuselage).

Mechanical gain and differential
Many times the control horn and servo arm have different locations for installing the push rod. If the push rods (or pull-pull cables) are installed at the same distance from the pivot center, the travel is linear.

Some modelers will install the push rods so they are in a mounting hole farther from the pivot center in the servo and closer to the pivot center at the control surface. This will increase the travel. For precision, moving the push rod to the innermost hole on the servo arm and farthest from the pivot point in the controlled surface provides the greatest precision but the lowest possible movement.

Some vendors provide longer servo arms to help get the amount of travel a control surface needs.

Wear
Providing free movement for our control linkages is one of the goals. Checking that wear has not created slop is one of the routine inspections we should make. Those nylon parts will wear oval holes where they were once round. This introduces a great amount of slop. Check and replace these as needed. Make sure the parts aren't too tight. This speeds up the wear and causes repeatability problems.

Weight
Although not usually a primary factor, weight in some of the lighter models is a big thing. Building with components that add unnecessary weight is poor practice. Using composite materials such as carbon fiber rather than wooden dowels or threaded steel rods makes a difference in both weight and

precision.

Usually the choice of materials is dependent on several of the factors already mentioned. A good scale (digital or otherwise) is a wise investment for the builder. Choosing parts that perform identically based on their weight is the right way to build. If a model needs additional weight for balance, why not choose the parts that will help balance the model rather than installing dead weight (i.e. lead) later.

Coolness
Advertisers being good at what they do, the neatest products might not be what you want in your model. Sometimes the simplest, tried-and-true parts are the ones to stay with.

Ask your fellow modelers if they've used the new products. You might save yourself some headaches.

You may want to avoid:

• Clevises that have multiple parts that could get lost.
• Plastic stuff that can wear (due to vibration).
• 2-56 linkages.
• Parts that require a special tool to adjust might not be field-friendly.

You do want to avoid metal-to-metal connections.

Ease of use
Using parts in control linkage that make adjustments easy to do and will hold those adjustments from outside the model is a huge plus. Also, make sure the adjustable bits can be locked in place and unlocked for later adjustments. Some modelers CA their threaded parts; others use lock nuts. Some use thread locker; some use safety wire. Many use a combination of these.

Ideally we want our adjustments to stay forever; however, if we've selected less-than-ideal components, parts with a different coefficient of expansion (the ratio of change in length or volume of a body to the original length or volume for a unit change in temperature), or incorrectly installed our components, the model may have very different flying characteristics from one day to the next.

A few tips:

• Keep the control linkage as short as possible.
• Use mechanical adjustment to set end points and center rather than relying on a computer radio.
• Use silver solder on these types of joints. 60/40 rosin core solder (electrical) should not be used! Make sure to use flux when soldering. Clean the flux off; it is usually an acid.
• Coreless digital servos are expensive for a reason: They are fast, precise, repeatable, and strong.
• Control systems always fail at the weakest point. If you use balsa servos mounts or thin light plywood, guess where the weak link is …
• Providing bearings for push rods and attachment points for the plastic sleeve is a good thing. Depending on the load and power requirements, you may need to put one every six inches or less.
• Bending the control wires to reach the attachments points weakens the system.
• Slop causes flutter. Slop occurs in the servo output spline, control horn holes, hinges, and push rod itself. Installing the control rods so they run straight between the servo and the control horn is best but not always possible.
• Counter balancing control surfaces (equal weight on both sides of the hinge), usually prevents flutter.
• Some ARF vendors supply 2-56 or 2 mm metric parts. Sometimes the threads are rolled; sometimes they are cut. Metric and standard (SAE) are not exactly compatible or interchangeable. Close is not good enough. Check your parts and make sure they fit correctly.

Hinges
Another area that brings modelers' opinions to the forefront is hinges. Many use the hinging techniques that become familiar. This is all right if you are building models in the same class (size, weight, power, capability, etc.).

When you migrate from Peanut or .40-size Sport Scale to other types of models, different choices must be made.

Many kit manufacturers include or at least recommend the type and number of hinges to use. Lately, the larger 3-D type ARC/ARF kits do not include any reference to hinging (or control linkages). They leave it up to the modeler to use the components he or she likes.

There are several new tools available to make hinging easier. The idea is to provide a strong connection between parts that have no slop, small or no air gap, no friction or binding, and are simple and repeatable in use.

CA: Many vendors make these glues, but they are not all equal. I have seen many hinges installed with CA fail. When they do, it is tough to fix, often involving cutting the control surface off and re-hinging. Still, some modelers swear by them and not at them.

Non-CA: Most hinges are installed with epoxy or white glue. If you use the hinges with a metal hinge pin, before gluing these in, it is a good idea to put oil or Vaseline on the hinge-pin area to prevent glue from migrating to these areas. Pinning the hinge is a very good idea and may save your model someday.

Celebrating Flight

Lockheed Constellation

From Wikipedia

The **Lockheed Constellation** (**"Connie"**) was a propeller-driven airliner powered by four 18-cylinder radial Wright R-3350 engines. It was built by Lockheed between 1943 and 1958 at its Burbank, California, USA, facility. A total of 856 aircraft were produced in four models, all distinguished by a triple-tail design and dolphin-shaped fuselage. The Constellation was used as a civilian airliner and as a U.S. military air transport, seeing service in the Berlin Airlift. It was the presidential aircraft for U.S. President Dwight D. Eisenhower.

The Constellation's wing design was close to that of the P-38 Lightning, differing mostly in scale. The distinctive triple tail kept the aircraft's overall height low enough to fit in existing hangars, while new features included hydraulically-boosted controls and a thermal de-icing system used on wing and tail leading edges. The aircraft had a top speed of over 340 mph (550 km/h), faster than that of a Japanese Zero fighter, a cruise speed of 300 mph (480 km/h), and a service ceiling of 24,000 ft (7,300 m).

According to Anthony Sampson in *Empires of the Sky*, the intricate design may have been undertaken by Lockheed, but the concept, shape, capabilities, appearance and ethos of the Constellation were driven by Hughes' intercession during the design process.

With the onset of World War II, the TWA aircraft entering production were converted to an order for **C-69** Constellation military transport aircraft, with 202 aircraft intended for the United States Army Air Forces (USAAF). The first prototype (civil registration NX25600) flew on January 9, 1943, a simple ferry hop from Burbank to Muroc Field for testing. Eddie Allen, on loan from Boeing, flew left seat, with Lockheed's own Milo Burcham as copilot. Rudy Thoren and Kelly Johnson were also on board.

Lockheed proposed the model **L-249** as a long range bomber. It received the military designation XB-30 but the aircraft was not developed. A plan for a very long-range troop transport, the C-69B (**L-349**, ordered by Pan Am in 1940), was canceled. A single C-69C (**L-549**), a 43-seat VIP transport, was built in 1945 at the Lockheed-Burbank plant.

The C-69 was mostly used as a high-speed, long-distance troop transport during the war. A total of 22 C-69s were completed before the end of hostilities, but not all of these entered military service. The USAAF cancelled the remainder of the order in 1945.

After World War II the Constellation came into its own as a popular, fast, civilian airliner. Aircraft already in production for the USAAF as C-69 transports were finished as civilian airliners, with TWA receiving the first on 1 October 1945. TWA's first transatlantic proving flight departed Washington, DC on December 3, 1945, arriving in Paris on December 4 via Gander and Shannon.

Trans World Airlines transatlantic service started on February 6, 1946 with a New York-Paris flight in a Constellation. On June 17, 1947 Pan American World Airways opened the first ever regularly scheduled around-the-world service with their L749 *Clipper America*. The famous flight "Pan Am 1" operated for nearly 40 years.

As the first pressurized airliner in widespread use, the Constellation helped to usher in affordable and comfortable air travel. Operators of Constellations included TWA, Eastern Air Lines, Pan American World Airways, Air France, BOAC, KLM, Qantas, Lufthansa, Iberia Airlines, Panair do Brasil, TAP Portugal, Trans-Canada Air Lines (later renamed Air Canada), Aer Lingus and VARIG.

General characteristics

- **Crew:** 5 flight crew
- **Capacity:** typically 62-95 passengers
- **Length:** 116 ft 2 in
- **Wingspan:** 126 ft 2 in
- **Height:** 24 ft 9 in
- **Wing area:** 1,654 ft^2
- **Empty weight:** 79,700 lb
- **Useful load:** 65,300 lb
- **Max takeoff weight:** 137,500 lb
- **Powerplant:** 4 × Wright R-3350-DA3

Performance

- **Maximum speed:** 377 mph
- **Cruise speed:** 340 mph at 22,600 ft
- **Stall speed:** 100 mph
- **Range:** 5,400 mi
- **Service ceiling:** 24,000 ft
- **Rate of climb:** 1,620 ft/min
- **Wing loading:** 87.7 lb/ft^2
- **Power/mass:** 0.094 hp/lb

Editorial

Surviving the Heat

Heat. Humidity. It seems that the weather is never 100% cooperative with modelers. When the rain finally breaks and the wind finally becomes reasonable, we jump to 100º and 70% relative humidity. But the wind is fairly calm – which makes the heat and humidity feel worse.

The good flying weather is something that all of us want to take advantage of every chance we get, and most of us are very willing to put up with the heat. The heat, though, is not something to be taken lightly, especially when the humidity rises with it. BUT, it can be dealt with if you follow some simple practices.

Stay hydrated. This is one of the most important things you can do. Even when the humidity is high, you sweat. When the temperature is above 98.6º, sweating is the only way the body can loose heat. Though the evaporation of the sweat cools you body, the liquid form (that never seems to evaporate when the humidity is high) does carry heat out of your body. As you loose hydration, your organs, muscles, and brain cannot function properly. If you are going to be at the field for just an hour or two, here is a method that works well. Put one large bottle of water (about a liter) in the refrigerator and one in the freezer the night before you are going to fly. When you go to the field, take them both with you. By the time you have finished the refrigerated one, the frozen one will have melted enough to drink. If you are staying longer, freeze several bottles and put them in a small cooler.

Dress appropriately. Dark colors only look cool. Light colored, loose fitting clothes are better for dealing with the heat. Cotton or other absorptive fabrics are best for keeping cool. Sunglasses only shield your eyes from UV rays, they also help you not to squint, which uses muscles and increases the body's generation of heat. A hat (light colored, too) will help keep the sun off of your face and neck. One with a ventilated crown will also keep you head cooler (which will make you feel cooler all over). The final, and one of the most important, things you should wear is a health application of sunscreen – at least SPF 30 – on all exposed body parts. I have a friend who just had to have a cancerous spot removed from her face, requiring an incision about 4" long. The cancer was not the most dangerous, but was caused by over exposure to sunlight. Use the sunscreen, so you won't have skin cancer when you turn 50.

Don't overexert. Minimize your movements and physical exertion. And breathe properly. Breathe in through your nose and out through your mouth. This brings in cool air to cool your hypothalamus (this is the part of your brain that lets the other parts of the brain process information) and expels hot air away from it. Take frequent breaks, even sitting in your car with the A/C running periodically to cool off. Even at the current prices, the gasoline you will use is far cheaper than a trip to the emergency room with heat stroke.

You can enjoy flying during the hottest days just following some common sense guidelines. Age, unfortunately, does have an impact on your ability to endure heat. What might cause cramps in a 16-year old can cause heat exhaustion in a 40-year old and heat stroke in a 60-year old. It may be best, if possible, to avoid the hottest temperatures during the day by flying in the early morning and late evening.

Have fun, but stay safe!

That's my opinion – it oughta' be yours! ☺

Letters To The Editor

Need to get something off your chest? Want to solve all of the club/s problems? Write a letter! I welcome anyone (member or not) to submit an opinion in writing so long as it is civil in its expression (I reserve the right to make that determination). You can email your letters to the editor to me at Don_Lewis@comcast.net, or just give them to me at a club meeting.

Novice Nuances

Dual Rates – the Good, Bad, and Ugly

By Clay Ramskill

Usually found on radios with 6 or more channels, dual rates allow you, with a flip of a handy switch, to change how much servo response you get from a movement of your control stick. There is a switch for each channel involved, and an adjustment for each which allows you to "dial in" how much less response you'll get with the dual rate "on".

Dual rate use is fairly simple - with the dual rate "off" you get normal response; that is, full servo rotation with full stick deflection. Turning dual rate "on", you get only a certain percentage of the servo rotation you would normally have had at any stick deflection. That percentage is what you control with the adjustment on the transmitter. This is a nice capability - your plane can be set to be wildly responsive for aerobatics, yet with dual rates on, you can still fly very smoothly, for landing, for instance. Pattern fliers use this a lot.

THE GOOD. You could set your plane up such that with dual rate on, the elevator travel isn't enough to stall the plane, allowing smooth, stall-free flight. Turning the rate back up then would allow such maneuvers as snaps and spins. Some folks use dual rates for landing only, to stop overcontrolling at slow speeds. Dual rate capability is super for test flying a new plane, when you're unsure of just how responsive the plane will be. The possibilities are near endless.

THE BAD. The radios with dual rates cost extra bucks. You have more switches to twiddle with, and to check before flight. And in dual rate, you're not using all your servo travel - they will not be as accurate as they are using full travel, nor as powerful.

THE UGLY. The problem is, that you get used to having a certain response from your plane, and expect that response all the time. With dual rates in use, you must remember whether you're "in" or "out" at all times so you know what responses your plane is capable of. A BUNCH of planes have been crashed that way; the pilot wondering why his plane wouldn't pull out of a loop like it normally did! Or on dual rates, the plane couldn't respond quick enough to overcome some turbulence on landing.

The Bottom Line. If you have dual rates and use them, you've got to know at all times where those little switches are set. If you don't use them, set them such that if the switch is turned on, you still have 100% travel; that way, it doesn't matter where the switch is. NEVER set the rate such that the plane is unflyable or only marginally controllable with dual rate "on". You all know how Murphy's Law works, right?

Why Didn't I Think of That?

Removing Oil from Balsa

We had a Lazy Bee that got oil soaked and from advice we used Corn Starch after applying K2R. Applying corn starch to the area and heating with covering iron the oil was gone!!! It does work. If you can't find K2R then try mixing alcohol and corn starch together. Heavy on the alcohol, but not to the point of dripping. This will work, but it will take several applications if it is really bad.

Canopy Scratches

This may sound a little off but I have found the best way to cover canopy scratches is to spray them with clear. Works like a charm every time and only take a few minutes.

Failure Modes

By Jim Hoffman

Consider designs and procedures that may improve the reliability and longevity of your models ...

I have seen countless Control Line ships destroyed or damaged needlessly due to mechanical failures that could have been easily avoided. The cause of the failure could have been avoided by an alternative design or procedure. In aerospace world, as a product is conceptualized and designed, the team looks very hard at all possible potential failure modes. The possible failure mode effects are used as a guide as the design progresses and the zillion design evaluations are made. This approach certainly can be used with our models; it has been a part of my modeling program for many years.

I look at every component and consider every possible failure mode I can imagine. From there, I next look at three parameters:

• **Severity of the failure.** Severity can be ranked from high to low. If this failure occurs will it cause personal injury or perhaps an immediate crash? Lesser-severity failures certainly exist, which may result in performance reductions, or cosmetic issues.

• **Likelihood of the occurrence.** This is difficult to evaluate, but after enough years of experience and observation, one does develop a sense of the likelihood. In most industries there are actual records that give one a basis to compare the likelihood of various failures.

• **Detectability.** Many mechanical failures can be prevented by regular inspections of the airframe and equipment. A loose engine mounting screw can be detected by visual examination, torque check, or even a change in the sound of the airplane in the air. Usually the fastener can be tightened before anything really bad occurs.

In order to have reliable and long-lasting models one must address all failure modes. The magnitude of the time, cost, and weight penalties needed to resolve any failure mode ought to be linked to the three parameters listed. I have seen examples where all failure modes are given a score for severity, likelihood, and detectability. This is overkill for us.

The most elegant solution is to design away as many failure modes as possible.

Examples of Possible Failure Modes.
Wimpy Bellcrank Mounting System: May be the poster child of a most nasty failure mode. Severity is very high—an in-flight failure will likely destroy the airplane. Likelihood is high due to the continuous flight loads on the bellcrank. Detectability is moderate if you do frequent pull tests.

An elegant solution is the hard point handle, which simply eliminates the cable altogether. The hard point style handle can also fail due to loose fasters, but this failure mode is common to the cable style handle also.

Hooking up your lines backward. Severity: again very high. Very few airplanes survive this error. Likelihood varies due to the individual, but is never zero. Attention to detail and careful preparation certainly can reduce the likelihood. We can all cite instances where very experienced veterans suffered the loss of an airplane due to this error. Detectability is pretty good if you really check up/down before you fly. This means more than wiggling the handle and observing the elevator wiggles.

A common solution is to have a handle and lines dedicated to each airplane. When I roll up, the cables and handle are never separated and are stored together. When I disconnect the cables for the airplane, I leave one connector on the cables. This makes it very unlikely that the lines will be hooked up backwards next time. I also clear the lines of twists and check that up is up, down is down, and neutral is neutral before each flight. Many others color-code the up and down lines on the handle, cables, and airplane leads out.

Cowl and landing gear mounts. Severity: this is lower than in the previous examples. The airplane will likely survive if the cowl or landing gear falls off. Likelihood again varies due to the individual but is never zero. Detectability is pretty good if you really check the fasteners frequently.

This is important to competition types, because the flight is disqualified if anything falls off the airplane.

Cowl: There are some nice design solutions to consider. Many stunters are built without a cowl. This makes for a little more effort to remove the fuel tank, but is not uncommon. There are some clever designs that restrain the cowl with a single fastener. I choose to use several fasteners to hold the cowl in place in the name of reliability. Should one fastener fail, the cowl will stay put with other fasteners.

Landing gear: Similar to the cowl. Permanently installed landing gear are not likely to fall off, but you give up ease of maintenance and adjustment. Again, a very good solution is to use multiple fasteners.

Wheel collars can loosen and allow a wheel to depart in flight. Severity: this is lower than in the other examples. The airplane will likely survive if a wheel falls off. Likelihood again varies due to the individual, but is never zero. Detectability is pretty good if you really check the fasteners frequently.

Again we are looking at a single set screw, which can result in a problem. The use of Loc-Tite is helpful. Many folks grind a flat on the axle to allow the set screw to better register. Another solution is to design the set screw away and retain the wheel with a soldered washer.

I have only scratched the surface of a very complex subject. I continuously look for possible failure modes and ways to simply design them away. I also pay a lot of attention when a failure occurs at the field and try to understand the cause of the failure. I hope that this is useful and makes your airplanes more reliable and longer lasting.

Product Review:

Corona DS 538MG Servo
From RCModelReviews.com

It's hard to find a good, cheap, reliable standard servo from a Chinese manufacturer -- and goodness knows, I've looked long and hard.

While I'm normally a big fan of Chinese products, I find myself reflecting on the fact that the good old HS425BB and S3001 servos from brand-name manufacturers such as Hitec and Futaba still seem to deliver levels of reliability that the Chinese just haven't been able to match.

Every time I think I've found a good "standard" servo (45-55g weight, 3.5Kg-5.5Kg torque) I end up being disappointed.

So, when I first popped the Corona DS 538MG on the test-bench I thought I'd found a servo that might not only match the 425s and 3001s of this world but even exceed them by a good margin.

Corona's offering is more than a standard servo - but at a standard-servo price.

I've seen these for sale from as little as US$10 from various online suppliers and the specs are pretty impressive. A huge 6.5KG/cm of torque, a digital amplifier, metal gears and not too slow either. Woohoo -- what a beauty!

And indeed, if Corona could get their act together in the area of quality control, they might have a winner on their hands -- but alas, I fear they have succumbed to the temptation to simply ship products without proper testing.

So here's what I found when I put these servos to the test...

Performance

As far as centering, precision and torque go, these servos are more than a match for any "standard" servo. Indeed, although they fell short of the advertised 6.5Kg/cm of torque, the samples I tested could deliver well over 5Kg/cm of torque before stalling and that is a very credible figure for a $10 servo.

Being digital, they also showed good holding torque, easily able to resist loads several Kg higher than the stall-torque.

When loaded, they made the typical digital-servo whining noise and delivered credible (if not outstanding) resolution and centering with no sign of overshoot or undershoot.

Durability

Now this is the hardest thing to test when reviewing a servo. I have been reviewing a lot of servos here at RCModelReviews but am only just getting around to publishing the final reviews because it's very clear that some servos work just fine "out of the box" but simply don't last.

Gears wear prematurely, amplifiers fail, feedback pots wear out and other problems often appear, only after a few months of regular use.

The reason I'm publishing the Corona review first is because it was the first servo to show signs of stress when actually put into use.

The first thing that became apparent is the softness of the gears.

When used on the ailerons of a 50cc gas plane, it took only a handful of flights before the gears were so worn that the backlash was unacceptably high. Okay, so you wouldn't put a "standard" servo in a gas plane, but these are touted as a hi-torque metal-geared servo so I would have expected them to last more than a couple of flights. Also, even when used on a nitro-powered model, the backlash quickly grew to unacceptable limits that encourage flutter and imprecise control.

But it gets worse...

Three of the four test servos have suffered catastrophic gear failures, all in exactly the same way...

There is a bell-shaped gear which is supposed to have the smaller part of the gear securely pressed into the larger bell-shaped section.

On three out of four servos tested, this interference fit has failed -- causing the gear to fall into two parts -- as in the pictures on this page.

This is totally unacceptable -- especially when one of the test servos exhibited this fault straight out of the box, with the motor spinning continously when powered up and no sign of any output shaft movement. On inspection it was obvious that the small section had never actually been pressed properly and punched (to expand it) into the larger gear section.

Sorry Corona -- this is a fail of epic proportion.

What a shame... if these servos had a better gearset they would simply make the good old plastic-geared analog servos redundant and become my preferred option for many models.

Unfortunately, all I can say is that if this is the standard of quality control being exercised by Corona, I could not honestly recommend anyone risk a model to these servos.

Perhaps it was just one bad batch -- but that is what Quality Control is there to catch so it clearly indicates a total lack of any real testing of this product or monitoring of quality levels out of the factory.

Maybe if/when Corona get their act together and deliver a DS 538MG with harder gears that are *properly* constructed and tested they can let me know and I'll take another look. In the meantime, I'll just keep looking for a great standard servo out of China.

Pro's:

- Low price
- Digital amplifier
- Metal geared
- Good torque, speed, centering and precision

Cons:

- Gears wear very quickly
- Zero quality control sinks the product completely

Steven Wright Statements

If you're not familiar with the work of Steven Wright, he's the famous erudite scientist who once said: "I woke up one morning, and all of my stuff had been stolen and replaced by exact duplicates." His mind sees things differently than most of us do, to our amazement and amusement. Here are some of his gems:

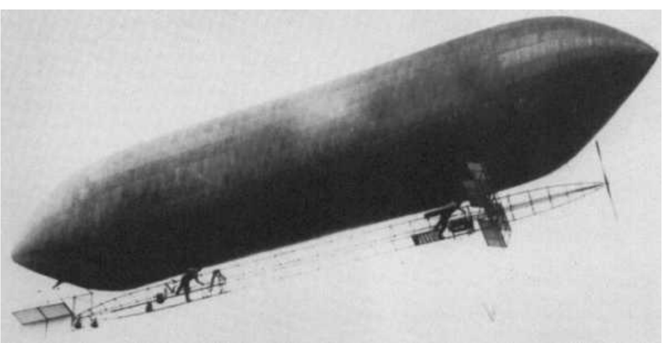
- A conscience is what hurts when all your other parts feel so good.
- A clear conscience is usually the sign of a bad memory.
- If you want the rainbow, you got to put up with the rain.
- All those who believe in psycho kinesis, raise my hand.
- The early bird may get the worm, but the second mouse gets the cheese.

History of Flight

Dirigibles

From Century-of-Flight.net

Once balloons were outfitted with propulsion devices and thus became dirigibles (or airships), un-powered balloons were used primarily for upper atmosphere research. In July 1901, two ambitious German physicists, Berson and Surring, established an impressive altitude record of thirty-five thousand feet (10,668km) that was to stand for some thirty years.



In the early decade of the twentieth century, airships developed along three lines: those that consisted of a balloon from which the power plant and the crew quarters dangled were known as non-rigid; airships with a skeletal structure encasing a balloon and to which a crew compartment and propulsion system were attached were called semi-rigid; and airships that were made of a solid outer shell, with the passenger and crew compartments attached and which had balloons inflated inside, were known as rigid.

Prior to 1904, when he turned his attention to airplanes, the pre-eminent builder of non-rigid airships was Alberto Santos-Dumont. His flights over Paris delighted the citizenry, particularly when a malfunction would result in a crash, from which the diminutive Brazilian was lucky to survive. He created a sensation in Paris (and entered aviation history) when he flew around the Eiffel Tower in his No. 6 and claimed the Deutsch de la Meurthe Prize established in 1900. Santos-Dumont used his No. 14 airship to test his aircraft before his historic flight of 1906.

In the United States, the non-rigid airships being constructed by Thomas Baldwin were all the rage. The first aircraft purchased by the U.S. military was a Baldwin dirigible known as the SC1 Equipped with a Curtiss motorcycle engine, these machines were easy to transport. They found great use during World War I when they were used extensively by the British and French for offshore antisubmarine patrol.

Semi-rigid airships replaced non-rigid ones with the improvement of motors and propellers, and a streamlined design boosted speed. Several successful semi-rigid airships were built by Paul and Pierre Lebaudy before 1910, and they performed so well that several governments ordered them for their fleets. A typical Lebaudy airship might be two hundred feet (61m) long and thirty feet (9m) in diameter, powered by engines of 70 to 100 horse- power, carrying a crew of four, and capable of covering distances of several hundred miles at a clip of forty-five to fifty miles per hour.

In England, the flamboyant American aerial showman Samuel E Cody teamed up with aerialist Colonel J.E. Capper to build the Nulli Secundus ("Second to None"), a semi-rigid airship that amazed Londoners in flights on October 5, 1907, and became a popular attraction when exhibited at the Crystal Palace. (The airship was torn apart just five days into the exhibit, however.)

The semi-rigid airships were abandoned after 1911, but only because German rigid airships performed so much better. In the United States, semi-rigid airships did not fare so well: The America, a semi-rigid dirigible built by Walter Wellman, made two failed attempts to reach the North Pole and went down in the ocean during a 1906 attempt to cross the Atlantic. The crew was rescued, but one of them, Melville Vaniman, decided to try again. His ship, the Akron, caught fire and crashed off the coast of Atlantic City, New Jersey, on July 2, 1912, killing Vaniman and his crew of four.

The era of the rigid airships is easy to pinpoint: it begins on July 2, 1900, with the flight of the Luftschiff Zeppelin 1 (LZ 1), over Lake Constance, Germany, and it ends with the Hindenburg disaster on May 5, 1937. Count Ferdinand Graf von Zeppelin had been an observer of the use of military balloons during the American Civil War, and soon became convinced that large dirigibles would be an effective means of air transportation.

The LZ 1, designed by chief engineer Ludwig Durr, was 420 feet (128m) long and thirty-eight feet (11 .5m) in diameter, with sixteen internal cells for lifting gas encased in a shell of aluminium and cotton. The dirigibles built by Zeppelin's company, DELAG, from LZ 1 to LZ 129 (the Hindenburg) varied in details, but they were all modelled on the principles established by the first one.

In the years prior to World War I, five DELAG Zeppelins (for by now the name had become synonymous with the aircraft) carried some thirty-five thousand passengers over long distances without mishap. The only fatalities were incurred in late 1913 when the two airships were on military missions. During World War I, Germany built more than one hundred airships for the purpose of bombing London, but these were no match even for the primitive fighters the British sent up against them. It was just as well, then, that the British rigid airship program never got off the ground. Its one attempt, the Vickers May fly, designed to be the largest then aloft (at 510 feet [155.5mj long), was torn apart by a strong wind as it was taken out of its hangar for a test flight.

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Sometimes You Just Have to Laugh…

A man walked into a doctor's office and asked the doctor to inspect his leg. The man said, "Here, put your ear to my knee."

The doctor put his ear to the man's knee and heard very faintly, "Come on, can I have five bucks, just five bucks?"

The doctor stepped back in horror, and the man said, "I know, but it gets worse. Put your ear to my shin." The doctor put his ear to the man's shin and heard very faintly, "Come on, can I have ten bucks, just ten bucks?"

Once again, the doctor stood up, perplexed. The man then said, "If that surprises you, put your ear to my ankle." The doctor put his ear to the man's ankle and heard faintly, "Come on, can I have twenty bucks, just twenty bucks?"

The doctor stood up and said, "Well, I can I make just one conclusion. Your leg is broke in three places."

You Might Be An R/C Modeler If…

By Bill Atkins, Byron, GA.

- ...You'll complain about buses and trucks with all that stinking diesel smoke but add it to your plane.
- ...You spend more time at the field working on your plane than flying it.

The Lighter Side of R/C